



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII  
901 NORTH 5TH STREET  
KANSAS CITY, KANSAS 66101

A717

Site #	Herculaneum Lead
ID #	5D 006266373
Bret	2.0
Other	
SRC	1.16.02

ACTION MEMORANDUM

SUBJECT: Request for Removal Action at the Herculaneum Lead Smelter Site, Herculaneum, Jefferson County, Missouri

FROM: Bruce A. Morrison, Remedial Project Manager *Bruce A. Morrison*  
Superfund Division

THRU: *for* Gene Gunn, Chief *Dave Drake*  
FFSE/SUPR

TO: Michael J. Sanderson, Director  
Superfund Division

Site ID#: 17  
Category of Removal: Time-Critical  
CERCLIS ID #: MODO06266373  
Nationally Significant/Precedent Setting: No

I. PURPOSE

The purpose of this Action Memorandum is to request approval for a time-critical removal action at the Herculaneum Lead Smelter Site (HLS), which is located at 881 Main Street in Herculaneum, Missouri, about 25 miles south of the St. Louis metropolitan area. The removal action will consist of providing temporary relocation to certain residents while their contaminated yard soils are replaced and their home interiors are cleaned. More specifically, persons who live at residences where the soil in the yard contains lead concentrations equal to or greater than 400 milligrams per kilogram (mg/kg) and where children 72 months old or younger reside at the home would be eligible for the temporary relocation. Other persons identified as being sensitive to lead exposure such as pregnant women or children with an elevated blood lead level, would also be offered voluntary, temporary relocation on a case by case basis.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

1. Background

The HLS site is an active lead smelter, the largest of its kind in the United States, and is currently owned and operated by the Doe Run company. HLS began operations in

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SUPERFUND RECORDS



1892 and is currently operating at 60% capacity today. The smelter facility consists of three main areas: (1) the smelter plant on the east side of Main Street; (2) office buildings on the west side of Main Street; and (3) the slag storage pile. The HLS site consists of the smelter facility as well as the extensive lead contamination found in the soils and dwellings of Herculanum.

The site property is approximately 52 acres in size. A slag disposal pile covering approximately 24 acres is located south of the smelter in a horseshoe bend of Joachim Creek. The slag pile is in the flood plain of Joachim Creek, in an area classified as a wetland. The smelter site is bordered on the east by the Mississippi River and on the north and west by residential areas. South of the smelter is the slag pile and wetland area. The slag pile is bordered to the east, west, and south by Joachim Creek, and to the north by residential areas and the smelter facility.

In May 2001, EPA, the Missouri Department of Natural Resources (MDNR), and Doe Run voluntarily entered into an Administrative Order on Consent concerning the Doe Run lead smelter in Herculanum, Missouri, and areas in the vicinity of the smelter that the smelter operation has impacted. The May 2001 Consent Order requires Doe Run to conduct certain response actions, including the cleanup of lead-contaminated soils in the community.

In August 2001, MDNR personnel observed that road dust had collected in long narrow piles along the street curbs and shoulders of roads in Herculanum that were used as truck routes for lead concentrate delivery trucks for the HLS facility. Limited sampling performed by EPA in late August and early September confirmed the existence of high levels of lead on the streets of Herculanum used by Doe Run as haul routes. The sampling showed that residential yards and parks along the haul routes contained high levels of lead.

Due to the discovery of lead concentrate spillage by delivery trucks, EPA notified Doe Run by letter on September 17, 2001, that the existing schedule contained in the May 2001 Consent Order for characterization of lead levels in residential soils needed to be expedited. In that letter, EPA notified Doe Run that within 60 days soil sampling needed to be completed at approximately 540 residences in the vicinity of the smelter. On September 24, 2001, Doe Run notified EPA that it would perform the expedited soil characterization sampling as requested by EPA in the September 17 letter.

Doe Run completed the soil characterization sampling effort in mid-November 2001. EPA has subsequently provided the results of the soil sampling to each resident whose property was sampled. The results show that a significant number of the residences sampled have children age six or younger at the residence and lead levels in soil greater than 400 parts per million. Some of the residences have lead levels in soil greater than 10,000 parts per million, primarily in areas directly adjacent to the haul routes. Approximately half of the residents have some portion of their yard soils contaminated with lead at a concentration exceeding 2,500 parts per million.

During October and November 2001, EPA collected interior dust samples from residences in Herculanum. These samples were generally collected at residences where lead levels in soil exceed 10,000 parts per million and where children reside who have been identified by the Missouri Department of Health (MDOH) as having elevated blood lead levels. Analyses of the samples shows that significantly elevated levels of lead are present in interior dust in such residences.

Doe Run, the Jefferson County Health Department, and MDOH have documented elevated blood-lead levels in a significant number of children who live in the vicinity of the smelter.

## 2. Physical Location

The slag pile and most of the smelter facility are located in Jefferson County, Section 29, Township 41 North, Range 6 East, although the northern portion of the facility extends into Section 20. Geographic coordinates of the site are 38° 15' 19.0" north latitude and 90° 22' 56.7" west longitude.

## 3. Site Characteristics

The site is an active lead smelter, the largest of its kind in the United States, and is currently owned and operated by the Doe Run company. HLS began operations in 1892 and is currently operating at 60% capacity today. The site also encompasses approximately 539 residential properties located north and west of the site. Two schools and two parks are also located within the radius of influence of the HLS facility and are included within the current site boundaries.

## 4. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

Lead is a hazardous substance as defined by Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and is listed at 40 C.F.R 302.4. Sampling results have confirmed that the levels of lead in surface soils and home interior dusts are significantly elevated above the health-based standard of 400 mg/kg at hundreds of residential properties surrounding the HLS facility. Ambient air monitoring has consistently documented that ambient air contains lead at concentrations exceeding the national ambient air quality standard. The most recent blood lead survey conducted in Herculanum by the Agency for Toxic Substances and Disease Registry (ATSDR) during the fall of 2001 concluded that 24 percent of children under 72 months of age had elevated blood lead concentrations exceeding 10 micrograms per deciliter (ug/dl).

5. National Priorities List Status

The Site is not currently listed nor proposed for listing on the National Priorities List.

6. Supporting Documentation

All reports of investigations, reports of sampling and analysis, and other relevant documents regarding the contamination at the Site will be contained in the Site's Administrative Record. The Administrative Record is currently being developed.

B. Other Actions to Date

1. Previous Actions

The EPA and the state of Missouri have monitored lead air emissions around the HLS facility for the past decade. Since 1992, the site has never been in attainment of the ambient air standard ( $1.5 \text{ ug}/\text{M}^3$ ) for lead. The Doe Run Company has voluntarily replaced yard soils at approximately 80 homes near the HLS facility during the time period from 1990 to 1999.

Additional previous actions are described in Section II.A.1 (Background) of this Action Memorandum.

2. Current Action

The EPA conducted home interior dust sampling, road surface sampling of concentrate haul routes, and Potentially Responsible Party (PRP) oversight and duplicate analysis of soil sampling during the fall of 2001. Following the review of this sampling data, EPA determined that the schedule for soil replacement needed to be expedited, many home interiors required cleaning, and lead concentrate transportation and handling practices needed to be improved. On December 21, 2001, Doe Run entered into a Consent Order (Order) with EPA to address these concerns. The Order requires Doe Run to develop a Concentrate Transportation and Handling Plan (Plan) describing the procedures to be taken to minimize lead releases from delivery trucks, loading areas, and storage areas. Doe Run is required to implement the Plan following EPA approval of said Plan. The December Order also requires Doe Run to conduct expedited surface soil replacements in accordance with the following schedule:

<u>Category</u>	<u>Time frame for yard soil replacement</u>
Homes with children at or under 72 months old with blood lead level in excess of 10 ug/dl and soil lead level exceeding 400 ppm	Within 30 days of being notified by EPA of location of residence
Child care providers with soil lead levels exceeding 400 ppm lead	Within 30 days of being notified by EPA of location of residence
Homes with resident children at or under 72 months old and soil lead level exceeding 400 ppm	Within 4 months of effective date of this Order
Homes, parks, playgrounds, and elementary schools with soil lead level exceeding 10,000 ppm	Within 6 months of effective date of this Order
Homes, parks, playgrounds, and schools with soil lead levels between 2,500 ppm lead and 10,000 ppm lead	Within 12 months of effective date this Order

In accordance with the December Order, Doe Run will also initiate home interior cleaning within 20 days of completion of yard soil replacement for each home respectively.

C. State and Local Actions to Date

1. State and Local Actions to Date

The MDOH participated with ATSDR in conducting a blood lead screening survey in the fall of 2001 that determined that 24 percent of the children screened in Herculaneum have blood lead levels exceeding 10 ug/dl. These agencies have also participated in numerous public meetings to provide health information related to lead exposure. MDNR is a party to the May 2001 Consent Order and continues to assist EPA with consultation and oversight activities at the site.

2. Potential for State/Local Response

None.

The Jefferson County Health Department, MDNR, and MDOH will continue to provide their services described in the previous section of this Action Memorandum. The EPA will coordinate all future activities associated with this removal action with MDNR and MDOH.

### III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Section 300.415(b) of the National Contingency Plan (NCP) provides that the EPA may conduct a removal action when it determines that there is a threat to human health or welfare or the environment based on one or more of the eight factors listed in Section 300.415(b)(2). The factors which justify a removal action at this Subsite are outlined below.

#### A. Threats to Public Health or Welfare

1. 300.415(b)(2)(i) -- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants, or contaminants.

A recent blood lead survey conducted in the fall of 2001 by the ATSDR determined that 15 of the 62 children tested (24 percent) had blood lead levels exceeding a health-based standard of 10 ug/dl. Concentrations of lead dust collected from roadways near the HLS facility were as high as 30 percent. Quarterly air monitoring conducted over the past nine years has consistently shown that Herculanum is not in attainment of the ambient air standard for lead.

Lead is a metal and a constituent of D008 hazardous waste. Lead is classified by the EPA as a probable human carcinogen and is a cumulative toxicant. The early effects of lead poisoning are nonspecific and difficult to distinguish from the symptoms of minor seasonal illnesses. Lead poisoning causes decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, digestive symptoms (particularly constipation), abdominal cramping, nausea, vomiting, and decreased appetite. With increased exposure, symptoms include anemia, pallor, a "lead line" on the gums, and decreased handgrip strength. Alcohol and physical exertion may precipitate these symptoms. The radial nerve is affected most severely causing weakness in the hands and wrists. Central nervous system effects include severe headaches, convulsions, coma, delirium, and possibly death. The kidneys can also be damaged after long periods of exposure to lead, with loss of kidney function and progressive azotemia. Reproductive effects in women include decreased fertility, increased rates of miscarriage and stillbirth, decreased birth weight, premature rupture of membrane, and/or pre-term delivery. Reproductive effects in men include erectile dysfunction, decreased sperm count, abnormal sperm shape and size, and reduced semen volume. Lead exposure is associated with increases in blood pressure and left ventricular hypertrophy. A significant amount of lead that enters the body is stored in the bone for many years and can be considered an irreversible health effect.

2. 300.415(b)(2)(iv) -- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

Concentrations of lead exceeding 400 mg/kg have been found in soil at over 75 percent of 540 properties sampled in Herculaneum. Over 30 percent of the 540 properties have lead in soil at concentrations exceeding 2,500 mg/kg. Lead-contaminated soils may migrate via airborne dusts, surface runoff, and by people and pets transporting soils/dusts into their homes from the affected areas.

3. 300.415(b)(2)(v) -- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

Weather conditions may cause the lead contamination to migrate. High wind events could cause the lead-contaminated soils to migrate via airborne dusts. Rain or thundershowers may cause the lead contamination to migrate via surface runoff.

4. 300.415(b)(2)(vii) -- The availability of other appropriate federal or state response mechanisms to respond to the release.

There are no other state or federal authorities who are able to respond to the release of hazardous substances at the Site.

#### IV. ENDANGERMENT DETERMINATION

The actual release of a hazardous substance at this Site, if not addressed by implementing the response action selected in this Action Memorandum, presents an imminent and substantial endangerment to the health of the public that comes in contact with the Site. Federal and state agencies are recommending that immediate response action be taken to reduce potential exposure to lead.

#### V. PROPOSED ACTIONS AND ESTIMATED COST

##### A. Proposed Actions

##### 1. Proposed Action Description

Recent site characterization activities conducted at the Site have determined the presence of high levels of lead contamination in a significant portion of the town of Herculaneum, Missouri. The Doe Run Resources Company, a PRP is responding to the contamination with the implementation of an expedited cleanup action that consists of soil replacement and home interior cleaning.

~~This Action Memorandum proposes that residences in Herculanum that have children~~  
 72 months old or younger and an area of their yard contaminated with lead exceeding the 400 mg/kg site action level be provided with temporary relocation until yard soil replacement and home interior cleaning is completed at each respective residence. Other persons identified as being sensitive to lead exposure, such as pregnant women and children older than 6 months with elevated blood leads will also be offered temporary relocation on case-by-case basis until their residences are cleaned. The relocation would be offered to approximately 94 families on a voluntary condition. Based on the current schedule, it is anticipated that the relocation would range from 3 to 20 weeks, and would be contingent on what order the properties are addressed. The temporary relocation would be offered to additional Herculanum residences with special circumstances such as becoming pregnant or having a child older than 72 months that also has a blood lead concentration exceeding 10 ug/dl.

2. Contribution to Remedial Performance

The removal action described in this Action Memorandum will be consistent with future remedial actions that may be taken at this Site.

3. Applicable Relevant and Appropriate Requirements (ARARs)

There are no ARARs for the proposed action.

5. Project Schedule

Response activities are anticipated to begin sometime in late January 2002 and require approximately five months to complete.

B. Estimated Costs

Extramural Costs:

Regional Allowance Costs	\$360,000
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Extramural Costs Contingency (10%)	<u>\$ 36,000</u>
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Subtotal Extramural Costs	\$396,000	<i>✓ Commitment Notice issued 1-16-02</i>
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REMOVAL PROJECT CEILING	\$396,000
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The EPA has identified 94 families eligible for temporary relocation. A limited number of additional persons who are identified as being potentially sensitive to lead exposure may qualify for temporary relocation.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action will continue to potentially expose children, to the lead-contaminated yard soils and potentially contaminated home interiors.

## VII. OUTSTANDING POLICY ISSUES

None.

## VIII. ENFORCEMENT

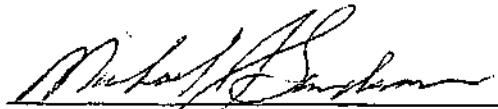
See attached Confidential Enforcement Addendum.

## IX. RECOMMENDATION

This decision document represents a selected removal action for specific contaminated residential properties where children 72 months or younger, pregnant women or other sensitive populations reside at the Herculaneum Lead Smelter Site in Herculaneum, Missouri. The removal action was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on recent site characterization sampling results collected in the fall of 2001. The total removal project ceiling is \$396,000, this total comes from the Regional Removal Allowance.

Conditions at the Site meet NCP Section 300.415(b)(2) criteria for a removal action and I recommend your approval of the proposed removal action.

Approved:

  
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Michael J. Sanderson, Director  
Superfund Division

1/16/02  
Date

Attachment

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Enforcement Addendum  
Action Memorandum  
Herculaneum Lead Site

The Doe Run Resources Corporation owns and operates the lead smelter in Herculaneum which is the source of the contamination in the community. Doe Run is liable under Section 107(a) of CERCLA with respect to this Site, and Doe Run is performing residential soil and interior dust cleanups at the Site pursuant to Administrative Orders on Consent entered into by EPA and Doe Run in May 2001 and December 2001. However, with respect to the temporary relocation removal actions called for by this Action Memorandum, the Agency has decided, in the exercise of its enforcement discretion, to proceed with the temporary relocation as a fund lead removal.

There are two reasons for the Region's decision to proceed fund-lead without offering Doe Run the opportunity to perform the action: (1) the need for the action to begin almost immediately; and (2) Doe Run's deteriorating financial situation.

We expect to begin relocation activities immediately after the Action Memorandum is signed. If the PRPs were to perform this action we would need to get an enforceable instrument and an approved work plan in place before work could commence. Such things typically take, at a minimum, several weeks and often considerably longer. Thus, as a practical matter, it is simply not feasible to have the relocation actions performed in a timely way or PRP-lead action.

In addition, in negotiations three weeks ago between EPA and Doe Run on an administrative order for yard cleanups at this Site, Doe Run asserted that it did not have the ability to finance all the actions that EPA was asking for as part of the negotiation. The company provided detailed financial information to EPA to document its financial condition. Doe Run ultimately agreed in those negotiations to perform the actions being requested by EPA, but only after EPA provided some relief to Doe Run on pending cost reimbursement obligations the company has at other Sites. The company's cash-flow is extremely tight right now, and given what transpired during the other recent negotiations, it is highly unlikely that the company could or would finance additional response actions right now, on top of the actions that they just agreed to perform.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated to be \$630,474.

Cost Estimates:

Direct Extramural Costs:	\$396,000
Direct Intramural Costs:	\$ 7,400
Indirect Costs:	\$227,074
Total	\$630,474

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Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgement interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.